

# THE FIRST PREBASIC MOLT OF THE YELLOW-BREASTED CHAT

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Ornithologists long ago noticed the occurrence of molt in the outer primaries of young Yellow-breasted Chats (*Icteria virens*). From this fact, they not illogically concluded (starting with Dwight, 1900:282) that the first prebasic (postjuvenile) molt in this species is complete. As they found no evidence of molting remiges in the young of any other North American parulids (purported exceptions discussed later), the idea developed that this molt separated *Icteria* from all the other genera. Together with its exceptional behavior, bill shape, and mouth color, this led to justifiable doubts as to whether the genus belongs in the Parulidae or in some other family.

By now, the supposed "complete postjuvenile molt" of the Yellow-breasted Chat has become all but legendary. It is cited in such a standard work as Bent (1953:590) and it continues to appear in more recent papers, such as Ficken and Ficken (1962). Blake (1962) calls it "now well established."

The present paper proposes to reopen the question of the completeness of this molt and to assess its possible taxonomic and other significance.

## MATERIALS AND METHODS

For years, in connection with studies of migration routes and dates, I have routinely collected warblers, in Arizona and at times elsewhere, from mid-August on into the autumn. Age was determined whenever possible by direct examination of the skull and, in females, also by the condition of the ovary. In addition, a series of *Icteria v. virens* netted in Veraacruz in September 1965, in connection with virological studies, was kindly made available to me in the flesh by Dr. Robert W. Dickerman, to whom I express my gratitude.

## THE MOLTS OF *ICTERIA*

In my limited collecting in spring, I have found no evidence of any regular prealternate (prenuptial) molt in the Yellow-breasted Chat. This is in agreement with the findings of previous workers. Thus the summer aspect or breeding plumage, which hardly differs from that of winter, is achieved entirely by wear.

In Arizona and Sonora, at least, the prebasic (postnuptial) molt of adults seems to take place on or near the breeding grounds. This may be true of the species generally, as of so many Parulidae. At least, I have no evidence of worn or molting chats, of any race (or age), at a point distant from the breeding areas. In some chats the molt continues into early October.

The same general principles apply to young. Not unlikely these scatter

more than adults, as a natural consequence of adult territoriality and youthful inquisitiveness. It is also likely that there is a wider spread in the dates of molting, depending on those of hatching. Some young, presumably birds that hatched late, still wear considerable amounts of juvenal plumage into mid-September. They doubtless molt into October.

Careful examination of young chats ( $n = 30^{\pm}$ ) in late summer and early fall, shows that, with one possible exception, the molt is *not* complete. Usually the four innermost primaries in each wing are retained from the juvenal plumage. The number varies to some extent, ranging from 3 to 6. In one case, Dickerman and I found a young female *I. v. virens*, now Delaware Mus. Nat. Hist. 26458, which had indeed molted most or all of its primaries—certainly at least the outer 7. This is an exceptional case, and I suspect that some late-hatched birds may molt no primaries at all. This pattern of molt is true of both *I. v. virens* and of Arizona *I. v. auricollis*.

Whether or not the secondaries are normally molted is more difficult to ascertain. These remiges, protected by the overlying tertials, do not fade and wear so quickly, nor are they as easily studied in dried skins. Furthermore, the problem of whether immature chats molt the rectrices remains unsolved. Those I have examined appear to have retained them. The tertials, however, seem to be molted. Examination of more young chats in late summer is needed, particularly of individuals that are in the midst of their primary molt.

#### MOLT AS AN AID TO AGE DETERMINATION

This molt pattern affords a new method for determining the age of chats in fall, winter, and, to some extent, later. A freshly-molted adult has a relatively uniform wing. All the primaries are about the same color and texture—dusky and unworn. The outer (9th) primary is usually shorter than the 4th, which is decidedly longer (2, commonly 2.5, to 3 mm) than the 3rd; this in turn is often 2 mm longer than the 2nd. Usually primaries 3, 4 and 5 show a steady, almost even progression of increased length in both wings. The difference in length between any primary and the next is seldom more than 2.0 times the immediately preceding difference.

Fall immatures, on the other hand, usually show a definite break where the darker, fresher, less brownish outer primaries begin. In at least one wing there will be a difference of 3 to 7 mm between the innermost (shortest) fresh outer primary and the outermost (longest) old inner one. This difference is  $2\frac{1}{2}$  to 5 times that between the outermost old primary and the adjacent longest old primary. In adults the difference between this set of primaries is rarely more than 4 mm. In addition, the 9th primary in immatures is usually about as long as the 4th, or even a bit longer. In adults, as

mentioned above, it is usually shorter. (One must, of course, check for broken or missing primaries.)

As wear progresses through winter and spring, the somewhat subtle color difference of the primaries usually disappears. Even so, less-than-one-year-old birds are often recognizable by the abrupt gap, in at least one wing, between the gradual gradient of length of the inner primaries and the abrupt gradient of the outer ones.

Of course, the usual skull differences (degree of "ossification") are also useful in early fall. In late September and early October most young still have the skull largely or wholly unossified, and narrow anterior or median "windows" persist in the few November-December immatures I have seen. Some probably retain windows into January, but I have no proof of this. At any rate, I seriously question the statement of Dennis (1967:134) that by 2 December "all Chats regardless of age" would probably have ossified skulls. The specimen reported by him should be reexamined in accordance with the above molt criteria.

I am much less confident of the usefulness of mouth-color in age determination. The black mouth of breeding males is a *seasonal* development. In early fall they still show traces of dusky, but these possibly vanish later. Adult females in fall may still show a little black in the inside of the upper mandible or maxilla, but this is chiefly limited to the distal median part.

#### TAXONOMIC CONSIDERATIONS OF MOLT

Three other wood warblers have been stated or implied to have complete first prebasic molts. Of these, the Common Yellowthroat (*Geothlypis trichas*) has already been restudied by Ewert and Lanyon (1970): they found no evidence of such a molt. Dennis (1958) also reported such a molt in the Pine Warbler (*Dendroica pinus*), as well as mentioning another case of a juvenile chat that "had nearly completed the tail molt." Dwight (1900), on the contrary, found this molt incomplete in *D. pinus*, as have I in the few juveniles examined: I suspect that Dennis was in error in reporting the molt to be otherwise. Finally, there is the purported case of a complete first prebasic molt in the Yellow-rumped Warbler (*D. coronata*), mentioned in Phillips et al. (1946). A complete body molt was intended, indeed and implied—as the passing mention of "a complete prebasic molt" occurs in the discussion of seasonal variation in coloration, i.e. body plumage. At any rate, to my definite knowledge, only *Icteria* among the young of North American Parulidae actually regularly molts any of its primaries.

What other songbirds, then, do show a first prebasic molt approaching that of *Icteria*? This pattern is more or less regular in shrikes (*Lanius*), occurring in species of both New and Old World (Philippines, at least). It

is also found in most species of *Passerina* buntings, including "*Guiraca*" *caerulea* at least occasionally (i.e. Delaware Mus. Nat. Hist. 13113). I do not, however, find evidence of it in Rosita's Bunting, *P. rositae*.

Since it is most unlikely that *Lanius*, *Icteria*, and *Passerina* have any real relationship, I can only conclude that molt patterns do not elucidate the taxonomy of *Icteria*. More promising are anatomical data such as those of Beecher and George (*in Eisenmann*, 1962:267).

## SUMMARY

Despite ideas to the contrary, the first prebasic molt of the Yellow-breasted Chat is incomplete and of doubtful taxonomic importance; but it does afford a valuable clue for age determination, even into the following spring or summer.

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